

Environmental Medicine in Germany—A Review

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In this review I describe the development of environmental medicine as a specialized field of clinical medicine in Germany. New scientific societies were founded, based on traditions of public hygiene and occupational medicine, as a reaction to environmental issues concerning human health. Environmental medicine issues were also addressed by independent “critical” physicians. The first institutions to accept patients were centers for environmental medicine affiliated with research institutions and/or with the public health service. Medical professional organizations, particularly the German General Medical Council, described the need for and formulated conditions for additional qualification for doctors in environmental medicine, including a 200-hr course. This course and a qualifying exam were passed by about 3,000 doctors, mainly from the public health service and from occupational medicine. Unfortunately, few general physicians in primary outpatient care were similarly trained. To date, no representative study has been conducted on environmental patients, but I include in this review a typical list of patients’ complaints. I also summarize research activities typical for environmental medicine in Germany. Present problems concern accounting systems and, for example, diagnosis and treatment of patients with multiple chemical sensitivities (MCS). A coordinated research program on MCS has been started. **Key words:** courses, environmental medicine, historical development, institutions, research areas, review for Germany, scientific community, specialization and further education. *Environ Health Perspect* 110(suppl 1):113–118 (2002).

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Adverse effects of the environment on human health have become a major issue throughout the world during the last several decades. This issue is influenced not only by such events as Love Canal, Seveso, and Chernobyl but also by recognition of the harmful effects of industrial emissions and, for example, worldwide waste problems. In most developed countries with established healthcare systems, environmental medicine has evolved as a special area with sources in the public health sector (environmental hygiene) and also in the individual care for patients with health problems linked to adverse environmental conditions. In this review I describe the development in Germany of environmental medicine as a discipline during the last 15–20 years and raise questions concerning the future. It may be worthwhile comparing the present situation in Germany with that in other countries with related or differently organized healthcare systems.

General Remarks on Environmental Medicine

Nature is not exceptionally kind to mankind, threatening existence and health through phenomena such as earthquakes, heat waves, and floods. There is, however, agreement that man-made influences are increasingly important, partially improving the situation (e.g., by provision of food and thereby increasing the carrying capacity of the globe) but also with doubtless negative consequences such as pollution of the air, water,

and soil. The last-mentioned changes in the environment can be ascribed to anthropogenic causes. A series of books spanning 40 years can be considered as landmarks in western countries (such as Germany) in their description of present and possible future developments, beginning with Rachel Carson’s classic work *Silent Spring* (1) and continued by “The Global 2000 Report to the President” (2), *Seveso ist Überall. Die tödlichen Risiken der Chemie* (3), and *Our Stolen Future* (4).

Responses to Environmental Issues

Responses by the Scientific Community

Responses to environmental issues are published by various groups in society, including the scientific and medical communities, governments via their public health services, and finally, the German Medical Association.

In Germany, statements on the environment and human health have been formulated by several medical and scientific societies: the German Society for Hygiene and Microbiology, the German Society for Occupational and for Environmental Medicine, and the Society for Hygiene and Environmental Medicine. Their statements tried to define environmental medicine in relation to classic work fields, namely, hygiene and occupational medicine, both of which have a long tradition in Germany. The relation of this new area of environmental

medicine to curative medicine, which concentrated on diseased individuals, was a problem for hygienists, who focus mainly on prevention and control of the media water, soil, air, and food. For occupational physicians this focus was not a problem. A main reason for competence was given by the assessment of causal relationships between exposure and health reactions, a matter inherent in occupational medicine. In 2000 a section on clinical environmental medicine was founded by their society.

Whereas most societies simply expanded their names to incorporate “environmental medicine” and retitled their journals, a new society was founded—International Society for Environmental Medicine (ISEM)—that brought together mostly scientists from the German-speaking countries: Germany, Austria, and parts of Switzerland. As did the other societies listed previously, ISEM started with annual meetings. In parallel, a German Society for Environmental and Human Toxicology was also founded.

Responses by the Medical Community

The established field of science was supplemented by groups of physicians in general medicine and in other medical fields who also raised their voices and reclaimed a sentinel function. The Interdisciplinary Society for Environmental Medicine (IGUMED) and the Ecological Association of Physicians (Ökologischer Ärztebund), both with critical backgrounds, were established. (In the late 1960s there was in Germany and other western countries a general antigovernmental or at least nongovernmental movement of critical, mostly academic people partially identified with the peace movement and the antinuclear power movement—a generation with a distance from what they called “the establishment.”) Their concern, of course, was also the environment. Many physicians also joined the Professional Association of Environmental Physicians (Deutscher Berufsverband der Umweltmediziner), a group originally focused on organizational aspects. The association also addressed problem areas of environmental medicine such as multiple chemical sensitivity

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(MCS) in an attempt to support patients with this syndrome despite the lack of adequate therapy. All these physicians, often organized on a local basis as well, were closely associated with environmental groups such as the Association for Environmental Protection in Germany (Bund für Umwelt und Naturschutz Deutschlands), which, as a non-governmental organization, also had a sentinel function for preserving nature.

Institutions Dealing with Environmental Medicine

Centers for Environmental Medicine

In the 1980s there was already a strong demand for information about environmental issues and the impact of pollution on human health. Primary care doctors, namely, general practitioners or internists, were only rarely able to respond. As a first step, several public institutions as well as research departments at universities and public health services in major cities, established outside departments for environmental medicine (5). Scientists and other committed doctors gave advice to patients and accepted letters of referral by other doctors. They also guaranteed a systematic scientific approach, documentation, and analysis. This work was very successful and was accepted by the public and the medical community. A nationwide network was established with a computerized platform and regular meetings. An information center, a mailbox system, and other new technologies were implemented and sponsored by the German Academy for Pediatrics and Youth Medicine and the German Federal Environment Foundation (Deutsche Umweltstiftung) (6). This network later lost its central position, partly because of financial difficulties, as the centers had to move from research funds to regular maintenance. In addition, many doctors who had gained the new supplementary title of "environmental medicine" (Umweltmedizin; see below) were able to care for these patients at that point. There is still a need for these centers as a second level of patient care before hospitalization, and this could be their main function. Lists with addresses for the referral of patients are available and updated regularly.

The Public Health Service

A further contribution to the new aspects of environmental medicine came from the public health sector of the German healthcare system run by the states and some big cities. This public health service (Öffentlicher Gesundheitsdienst) does not work in individual healthcare but concentrates on prevention and control of general conditions of human

life and on epidemiology, for example, registering the health status of preschool and school children. Environmental hygiene (see above) and environmental medicine are discussed at the annual conferences of this public health service and its governmental leaders. As early as 1987 they defined environmental medicine and the public tasks in this area. Public health doctors were also the first to postulate a common approach to the methods of risk assessment (1992) and to stress the importance of risk communication. This, of course, was urgently necessary for all the public hearings, for example, for the planning of waste disposal sites and incinerators, where German public health service and governmental officials are clearly involved.

Medical Professional Organizations

At the annual federal conference of the German General Medical Council in 1993, a decision was made concerning environmental medicine that resulted in two new job titles for relevant specializations (7,8). It had been observed in the years before that various professions with nonmedical backgrounds had established themselves in the new field and that the expert knowledge of the physicians had to be improved (9). The specialization of hygiene and environmental medicine was defined, with an extensive curriculum for further education. In addition, as a supplement to existing specializations such as internal medicine or lung diseases, family medicine, dermatology, and others, the additional qualification and supplementary title of environmental medicine (Umweltmedizin) was established. Whereas the title of hygiene and environmental medicine is meant for medical doctors working in institutions such as public health offices, the subspecialization indicates expert knowledge to people approaching doctors in primary healthcare. For both specializations the conditions for postgraduate medical training are defined by subcommittees at the federal level (10) and given as recommendations to the authorities in the 16 states of Germany. State medical associations have the responsibility for most professional and organizational aspects of healthcare, including postgraduate medical training and continuing medical education. Usually the recommendations from the federal level are adopted. In parallel to the federal organization, state medical associations have an expert committee on environment and human health consulting with the local president.

The implementation of hygiene and environmental medicine will not be considered further. The work of these specialists is restricted to a few institutions, laboratories, and bureaucracy and is not focused on individual healthcare. The number of these specialists does not exceed 100.

Specialization in Environmental Medicine

General Conditions

Specialization requires a course with 200 lessons according to a curriculum (see below), an 18-month association with a specialist licensed for further education, and at least 4 years of clinical work. This recommendation was basically accepted by all state medical councils, but difficulties with the 18-month requirement soon arose. This will be discussed later.

Course on Environmental Medicine

A booklet published by the German Medical Association and now in its second edition (10) describes the structure and content of the course. The topics have been defined primarily by the members of the federal committee, but there was also broad input by groups, individuals, organizations, committees, and scientific societies, especially those mentioned above. The text starts with a definition as follows:

Environmental medicine covers medical care for individuals with health problems or conspicuous findings, related to environmental factors by themselves or by physicians.

This definition is given after an introductory remark:

According to prevailing understanding environmental medicine is the interdisciplinary subject concerned with research, diagnosis, treatment and prevention of environmentally caused health problems. The central focus are anthropogenic environmental burdens and their health consequences. Usually a distinction is made between a more population-related and preventive component of environmental medicine and an alignment to individual care (ambulant or clinical environmental medicine).

The course is subdivided into five areas (Table 1). The items are taught in four blocks of 50 hr each. The items listed under "Organization" in the table can be integrated into these four blocks.

The additional degree is meant to provide doctors, predominantly in primary care, in hospitals, surgeries, consultation centres and surveying institutions, with the possibility to deepen their knowledge and skills in the field of environmental medicine, and particularly linking it with their specific medical background so that the doctors concerned can make use of their newly acquired knowledge in the context of their current specialization. In addition knowledge and skills are developed which open the possibility to find links to population based and preventive approaches of environmental medicine and to find effective solutions together with other institutions involved. (10)

Implementation of the Courses

There was no problem with the courses (11). Academies traditionally offer courses for

other specializations such as occupational medicine or social medicine where additional theoretical training is required. These academies and related institutions work in close cooperation with the state medical associations and are authorized by these bodies. During the early years from 1995 to 1998, up to 12 institutions offered courses closely following the curriculum. A total of approximately 3,000 doctors have participated, predominantly from the former West Germany. (The total number of doctors in outpatient care in Germany is approximately 120,000.) Did the doctors and their patients in the former East Germany have other needs and priorities? Participants during the first 3 years were mostly doctors from the public health service and occupational physicians; only a few were general practitioners. Obviously there was a problem, as subspecialization, as mentioned before, was meant for general practitioners active in individual patient care. Something went wrong and the reason was easily identified: General practitioners could not afford to close their offices four times a year for 1 week. Some academies offered weekend courses; these were successful despite the fact that eight weekends from Friday to Sunday were required.

Difficulties with Further Education

The courses had been frequented mainly during a period of transitional regulations. Participants were allowed to become "Umweltmediziner" without a formal association and without taking over a position in a licensed institution or practice. This requirement had been replaced by an extensive self-report on the activities in environmental medicine. The reports were reviewed by experts nominated by the medical association. When these regulations ended, there were almost no such positions available, except for some in the public health services and some in institutions of occupational medicine. (The shortage of these positions was recognized by the medical associations and new transitional regulations were again developed in most states; see below.) This situation, as well as inadequate financial

conditions led to an abrupt end of most courses; there were too few participants. Following are the possible reasons for this development.

- In most western states of Germany a saturation has been reached. There is no problem finding an Umweltmediziner even in smaller cities.
- A shortage of positions for the 18-month association.
- Environmental medicine with individual patients can be very time consuming; there are many difficult patients. Accounting systems do not compensate for this.
- The general boom of environmental medicine came to an end; restoration of public buildings and private homes was successful. Other life concerns predominate.

As a consequence, in 2001 only two academies offered courses, with participant numbers of about 20. Previously this number had been between 40 and 100. The academies have now agreed to cooperate closely and to transfer course requests. The other problem of association with a specialist licensed for further education has been solved by most of the state medical associations by various models of individual tutoring during the 18-month period. It is expected that the best solution will be taken over in the near future as a general recommendation by the federal medical council.

Environment-Related Complaints, Diseases, and Exposures

If environmental conditions or a specific compound are seriously considered either by the doctor or the patient himself as causal agent for a patient's complaints, symptoms, or illness, the patient is, by definition, an environmental patient. The doctor may identify the suspicious agent or, as is often the case in Germany, the patient believes he is environmentally ill and the causal agent has to be found. Only a few studies have published lists of potentially toxic materials or harmful conditions that may be suspicious (Table 2). Discussions in the media or local events promote these attributions.

The doctors whose notes were used for this list (12) assumed that about 66% of their cases showed psychologic eclipsing. Other lists showed a higher incidence of indoor problems such as formaldehyde and pentachlorophenol (PCP) (13,14). Really representative studies (representative for an area, for a population) are not available. A causal relationship to any of the symptoms was never evaluated. The symptoms most often presented were problems with breathing, sleeplessness, headache, loss of memory, restlessness, itching, and indigestion. Obviously, more research is needed.

As mentioned above, environmental medicine centers have a relatively long tradition in Germany and a rather close connection to research institutions. Many of them have presented reports on their cases and some include an evaluation of the causal relationship between suspected or documented exposure and symptoms (5,15,16). The spectrum of suspected agents does not differ from the one presented in Table 2. In about 60% of the cases, an agent was identified in the household, but only in less than 20% of the cases did a causal relation to the symptoms seem to be possible. Most patients in this special part of the healthcare system suffer from causes not identified by ambient monitoring. Many MCS patients are seen in these centers.

Regulatory Toxicology, Threshold Values, and Diagnostic Tools

Daily work in environmental medicine is supported by regulations and guidelines for concentrations of potentially harmful substances in the environment—water, soil, food, air, and common goods. Guidelines are provided by the World Health Organization (WHO), and some by the European Community, but most of them are published

Table 1. General structure of the course on environmental medicine in Germany.^a

Basis and methods, 48 hr
Analytical chemistry, environmental toxicology, environmental epidemiology, risk assessments and deduction of threshold values
Environmental burden, 48 hr
Load of environmental media, exposure to toxic compounds, effects and assessment, hygiene and microbiology
Diagnostics in environmental medicine, 40 hr
Patient record, body examination, laboratory findings, biomonitoring, use of information services
Prevention and therapy, 40 hr
Therapy in environmental medicine, preventive tasks of doctors, environmental protection in practice and clinic
Organization, 24 hr
Visits to institutions relevant for the environment, studies at the spot, use of information services, cooperation with relevant institutions, laws

^aData from Bundesärztekammer (10).

Table 2. List of environmental concerns (in decreasing frequency).^a

Xenobiotics in food
Cosmetics
Fungi
Chemicals in the household
Amalgam
Air pollution due to traffic
Air pollution due to industrial emissions
Solvents
Metals
Wood preservatives
Further indoor pollutants
Traffic noise
Formaldehyde
Further insecticides and herbicides
Air pollution due to domestic fuel
Electromagnetic fields
Noise in the neighborhood
Drinking water

^aPrepared by Dommes and Grosser (12).

by national bodies. In Germany there is a well-established system with threshold limit values for the workplace that are developed by a committee of the German Research Council and then usually taken over and enforced by the government. This process cannot be applied to the private environment but is employed for food, water, many articles for daily usage, and some common goods. Water and food are especially monitored and controlled; they are not distributed if certain limit values are exceeded. For indoor air in public buildings, a system for the development of threshold limit values recently has been defined. This provides preventive concentrations for intervention and, for purposes of restoration, concentrations to be reached as a goal. The present list gives such values for PCP, the polychlorinated biphenyls (PCBs), and formaldehyde and will be continued. The guidelines follow in principle the concept of WHO with acceptable daily intake values. They are published by a commission for indoor air quality at the Federal Environmental Agency (Umweltbundesamt). Although not formal law, the mere existence of these guidelines has a strong impact on public opinion and political action, for example, in schools and kindergartens. All this is the dominant field of environmental hygiene and the public health service.

For individual biomonitoring a parallel system has been developed that is important for public hygienists as well as for doctors in environmental medicine. A human biomonitoring committee (17), again organized by the Federal Environmental Agency (Umweltbundesamt), published the definition of HBM values. HBM I is defined as the concentration in body media (urine, blood) that is completely harmless. Concentrations above HBM I, but under HBM II, are also considered harmless; however, a control is recommended, as a specific exposure is possible, which should be identified and reduced with acceptable measures. If HBM II is exceeded, a potentially harmful situation is generally assumed that merits special attention, and the burden must be reduced immediately. HBM values are now published in rapid sequence. They already exist for lead (differing among children, adult men, and women of reproductive age), cadmium, PCP, and mercury. Reference values supplement HBM values and indicate normal background concentrations in the general population not specifically exposed. The 95th percentile of this distribution is taken as the reference value. This is merely a description and provides no toxicologic information but is very helpful information for doctors in environmental medicine when they have to discuss body burdens with their patients. Reference values are regularly published.

They exist for PCP, lead, and the three PCB congeners 138,153, and 180; the list will be extended. It is also corrected at intervals; PCP, as a consequence of the general ban, has lower reference values now than 20 years ago.

Specific Areas of Research in Germany

An extensive report on research activities in environmental medicine cannot be given in this review. In Table 3 an illustration is given, with emphasis on those areas considered (by the author) specific for Germany and the questions raised in the country during the last 10–15 years. The references given in the table are chosen as typical and (for the author) representative; they allow further searching.

Accounting Systems

In 1992 the Association of Statutory Health Insurance Physicians (Kassenärztliche Vereinigung Schleswig-Holstein and later, in 1994, also in Nord-Württemberg), an example from the early days, saw the necessity to structure and control the new field of environmental medicine. Doctors had been confronted with all sorts of data from ambient monitoring in private homes without standardization for sampling and analytical chemistry. Occasionally even health-related comments were added by nonphysicians. Projects were initiated where doctors could order a mobile laboratory (Umweltambulanz) with an expert for sampling (29,30). This expert went into the homes when a doctor

had decided that ambient monitoring would help to find a proper diagnosis. One such project was part of a contract, and an accounting system beyond the usual budget was arranged. (In the general contract between the statutory health insurance companies, to whom 90% of the population belong, and the doctors in outpatient care, fixed budgets are arranged for most areas of medical activities.) The contract was open to all medical doctors with the subspecialization or a specific qualification for indoor health problems (a special course of 40 hr, as a temporary solution) within this project. Many health insurance companies joined the project and provided the money beyond the existing budget.

Such arrangements were then made in most states of Germany, with and without scientific evaluation (31). It may be worth mentioning that the costs for ambient monitoring (the sampling in homes) were not included in the contract. Patients had to absorb the changes themselves (but not for the biomonitoring if this were ordered by a doctor for diagnostic purposes). The health insurance companies, in their competition for members, very soon gave lump sums to their members for the monitoring and sometimes also for restoration. Today, in 2002, a wide variety of accounting systems for environmental medicine exists in Germany. It is the task of the professional association (Deutscher Berufsverband der Umweltmediziner) to negotiate for a transparent and sufficient accounting system.

Table 3. Current research topics in environmental medicine in Germany, with selected references.

Topic	Authors
Electromagnetic fields	Michaelis et al., 1998 (18) Schuez et al., 2001 (19)
Low-dose irradiation, nuclear power plants	Michaelis and Keller, 1992 (20)
Indoor radon	Kreienbrock et al., 2001 (21)
Radon in East Germany	Kreuzer et al., 2000 (22)
Polyaromatic hydrocarbon-containing dust from tar oil-based parquet glue	Heudorf and Angerer, 2000 (23)
Emissions from traffic and noise	Bellach et al., 1995 (24) Szagun and Seidel, 2000 (25)
Asthma and allergies in East and West Germany	von Mutius et al., 1998 (26) Heinrich et al., 1998 (27)
Indoor pollution, sick building syndrome	Dettenkofer et al., 2000 (28)

Table 4. Project group "Studies on the causalities for the MCS syndrome (multiple chemical sensitivity) resp. IEI (idiopathic environmental intolerances) with special emphasis on the contribution of environmental chemicals."^a

Subject	Institution	Scientists
Hygiene and microbiology	University Hospital, Aachen	Wiesmueller, Ebel
Dermatology	Charite Berlin (University Hospital)	Fahron, Rose, Worm, Sterry
Psychiatrics	Bredstedt Hospital	Schwarz
Neurology	University Hospital, Erlangen	Kobal
General study	University Hospital, Freiburg	Lacour, Scheidt
Psychology	University Hospital, Hamburg	Bullinger
Occupational medicine	University Hospital, Munich	Nowak, Tretter

^aData from Paulini and Schimmelpfennig (38).

Clinical Ecology, Multiple Chemical Sensitivity, and Areas of Conflict

As in other countries, especially the United States, clinical ecology (32) found its place in Germany too. The scientific background is not discussed here. The existence of the clinical ecology approach to whatever is defined as environmental disease has to be mentioned. Patients with MCS and possibly related diseases such as chronic fatigue syndrome are attracted to alternatives to what is called academic medicine (Schulmedizin). There is an ongoing discussion about MCS and the problems that affected patients present (33–36). The unsatisfactory situation was even discussed in the federal parliament. This and high public awareness brought political parties and the government into action, and a research fund was established. An MCS study was planned (37), to be coordinated by the Robert Koch Institute, the former Federal Institute for Communicable and Non-communicable Diseases (38). MCS patients and their doctors involved (many of them in the Berufsverband) have formed groups and negotiated with the Robert Koch Institute on conditions for participation. An agreement for the start of research activities was reached in 2000 (Table 4).

Another area of conflict, specific for environmental medicine in Germany in the early 1990s, was a syndrome called Das Holzschutzmittelsyndrom (a syndrome due to exposure to wood preservatives) (39). Health complaints came from people living in private houses with the application mainly of PCP and lindane (γ -hexachlorocyclohexane). Many of these people had problems with their doctors and felt misunderstood. A self-help group was formed as a registered society, and a long-lasting court case, the Frankfurter Holzschutzmittelprozess, was started against the company that manufactured the wood preservative, with much public attention. The case ended with a settlement, but the whole affair was and still is influential in environmental medicine in Germany. This was one reason the monograph on PCP was one of the first to introduce the system of HBM values (40). With equally high public attention, a further dispute was conducted on the toxicology of amalgam (41).

Conclusion

The rise of environmental medicine as a discipline in Germany has come to an end; current problems of further education and accounting, as described above, will be solved in the near future. Developments such as the following seem to be predictable: Environmental medicine, at least in wealthy countries such as Germany, could split into

a) an area considering preservation of living conditions for mankind on this globe; b) the new and true public health aspect; and c) a rather different area of individual patient care dealing with controversial syndromes, uncertainty and distrust, risk perception, and

risks presented or seen in articles for everyday use and basic consumer goods. The latter would deal with concerns of people who no longer believe in progress as such or in agencies or authorities, and it could be seen in close connection to behavioral medicine.

Appendix. Textbooks and Journals

This list contains the most important and some new journals edited by German publishers. Additional journals may also address environmental medicine and claim a scientific approach to the questions and studies they present or refer to. Not mentioned are many journals devoted to technical aspects such as measurement of dust or noise, to water hygiene, or to the technology of sanitation and other concerns.

Zeitschrift für Umweltmedizin (Journal for Environmental Medicine) is a journal founded as early as 1992. It covers studies, reports, and information from science and practice. At its beginning this journal, edited by a small publishing house, was used as a forum of committed doctors but without demand for high scientific standards. Now a scientific committee is responsible for reviewed contributions. Each issue contains addresses of self-help groups, ambulatories, and meetings. The journal is the official organ of the Berufsverband (professional association) and of the German Society for Environmental and Human Toxicology.

Arbeitsmedizin, Sozialmedizin, Umweltmedizin (Occupational, Social, Environmental Medicine) is the traditional journal of the Society for Occupational Medicine and Environmental Medicine. Environmental medicine articles are contained in most issues. The journal has an editorial board and a peer-review system. It is the official organ of the German Society for Occupational and for Environmental Medicine.

Umweltmedizin in Forschung und Praxis (Environmental Medicine in Research and Practice) was founded in 1996 as a new scientific journal with an editorial board and peer-review system. It is devoted to all aspects of environmental medicine and related areas, an interdisciplinary organ for research, clinical work, practice, assessment, prevention and further education in the German-speaking regions. In addition to research articles, it is also used as a forum, and public announcements of government and other institutions are presented. A regular annex contains the list of ambulatories, courses, and meetings in Germany. The journal is the official organ of the

International Society of Environmental Medicine and of the German Society for Hygiene and Environmental Medicine.

International Journal of Hygiene and Environmental Health, formerly *Zentralblatt für Hygiene und Umweltmedizin*, serves as multidisciplinary forum for all research areas of hygiene and environmental and occupational health. The editors give high priority to articles on environmental toxicology, risk assessment, public health, environmental epidemiology, hospital hygiene, environmental microbiology, and clinical aspects related to environmental and occupational medicine. The journal is the official organ of the German Society for Hygiene and Environmental Medicine and also of the International Society of Environmental Medicine.

Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz. Edited by six governmental research institutes, this journal deals with all questions and areas of public health and health policy. It is used for the discussion and publication of guidelines.

Das Gesundheitswesen (The Health Care System) is the traditional journal for the public health service. It focuses on social medicine, health systems research, public health, education, and public health service. Environmental hygiene and environmental medicine are covered under the viewpoint of the public health service, namely, schools and other public places, but the control of food and common goods are also discussed.

Two handbooks are available as loose-leaf editions, both regularly growing and replacing out-of-date articles. *Handbuch der Umweltmedizin* (42) concentrates on aspects of pure research, whereas *Praktische Umweltmedizin* (43) puts more emphasis on practical aspects, representative case reports, and needs in the doctors' practices. Both handbooks can be used for both purposes. A series of textbooks is also available covering the wide spectrum of print media, namely, from paperbacks [Neuburger (44), Boese-O'Reilly (45), Reichl (46)] to monographs [Seidel (47), Popp (48)] to edited volumes with many authors [Mersch-Sundermann (49)]. Many doctors consider a publication of the Aertekammer Berlin, *Qualitätssicherung in der Umweltmedizin* (50), very helpful for daily use.

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